# Chapter 28

## Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes

**Notes.**

1.- Except where the context otherwise requires, the headings of this Chapter apply only to :

(a) Separate chemical elements and separate chemically defined compounds, whether or not containing impurities;

(b) The products mentioned in (a) above dissolved in water;

(c) The products mentioned in (a) above dissolved in other solvents provided that the solution constitutes a normal and necessary method of putting up these products adopted solely for reasons of safety or for transport and that the solvent does not render the product particularly suitable for specific use rather than for general use;

(d) The products mentioned in (a), (b) or (c) above with an added stabiliser (including an anti-caking agent) necessary for their preservation or transport;

(e) The products mentioned in (a), (b), (c) or (d) above with an added anti-dusting agent or a colouring substance added to facilitate their identification or for safety reasons, provided that the additions do not render the product particularly suitable for specific use rather than for general use.

2.- In addition to dithionites and sulphoxylates, stabilised with organic substances (heading 28.31), carbonates and peroxocarbonates of inorganic bases (heading 28.36), cyanides, cyanide oxides and complex cyanides of inorganic bases (heading 28.37), fulminates, cyanates and thiocyanates, of inorganic bases (heading 28.42), organic products included in heading 28.43 to 28.46 and 28.52 and carbides (heading 28.49), only the following compounds of carbon are to be classified in this Chapter :

(a) Oxides of carbon, hydrogen cyanide and fulminic, isocyanic, thiocyanic and other simple or complex cyanogen acids (heading 28.11);

(b) Halide oxides of carbon (heading 28.12);

(c) Carbon disulphide (heading 28.13);

(d) Thiocarbonates, selenocarbonates, tellurocarbonates, selenocyanates, tellurocyanates, tetrathiocyanatodiamminochromates (reineckates) and other complex cyanates, of inorganic bases (heading 28.42);

(e) Hydrogen peroxide, solidified with urea (heading 28.47), carbon oxysulphide, thiocarbonyl halides, cyanogen, cyanogen halides and cyanamide and its metal derivatives (heading 28.53) other than calcium cyanamide, whether or not pure (Chapter 31).

3.- Subject to the provisions of Note 1 to Section VI, this Chapter does not cover :

(a) Sodium chloride or magnesium oxide, whether or not pure, or other products of Section V;

(b) Organo-inorganic compounds other than those mentioned in Note 2 above;

(c) Products mentioned in Note 2, 3, 4 or 5 to Chapter 31;

(d) Inorganic products of a kind used as luminophores, of heading 32.06; glass frit and other glass in the form of powder, granules or flakes, of heading 32.07;

(e) Artificial graphite (heading 38.01); products put up as charges for fire-extinguishers or put up in fire-extinguishing grenades, of heading 38.13; ink removers put up in packings for retail sale, of heading 38.24; cultured crystals (other than optical elements) weighing not less than 2.5 g each, of the halides of the alkali or alkaline-earth metals, of heading 38.24;

(f) Precious or semi-precious stones (natural, synthetic or reconstructed) or dust or powder of such stones (headings 71.02 to 71.05), or precious metals or precious metal alloys of Chapter 71;

(g) The metals, whether or not pure, metal alloys or cermets, including sintered metal carbides (metal carbides sintered with a metal), of Section XV; or

(h) Optical elements, for example, of the halides of the alkali or alkaline-earth metals (heading 90.01).

4.- Chemically defined complex acids consisting of a non-metal acid of sub-Chapter II and a metal acid of sub-Chapter IV are to be classified in heading 28.11.

5.- Headings 28.26 to 28.42 apply only to metal or ammonium salts or peroxysalts.

Except where the context otherwise requires, double or complex salts are to be classified in heading 28.42.

6.- Heading 28.44 applies only to :

(a) Technetium (atomic No. 43), promethium (atomic No. 61), polonium (atomic No. 84) and all elements with an atomic number greater than 84;

(b) Natural or artificial radioactive isotopes (including those of the precious metals or of the base metals of Sections XIV and XV), whether or not mixed together;

(c) Compounds, inorganic or organic, of these elements or isotopes, whether or not chemically defined, whether or not mixed together;

(d) Alloys, dispersions (including cermets), ceramic products and mixtures containing these elements or isotopes or inorganic or organic compounds thereof and having a specific radioactivity exceeding 74 Bq/g (0.002 µCi/g);

(e) Spent (irradiated) fuel elements (cartridges) of nuclear reactors;

(f) Radioactive residues whether or not usable.

The term " isotopes ", for the purposes of this Note and of the wording of headings 28.44 and 28.45, refers to :

- individual nuclides, excluding, however, those existing in nature in the monoisotopic state;
- mixtures of isotopes of one and the same element, enriched in one or several of the said isotopes, that is, elements of which the natural isotopic composition has been artificially modified.

7.- Heading 28.48 includes copper phosphide (phosphor copper) containing more than 15 % by weight of phosphorus.

8.- Chemical elements (for example, silicon and selenium) doped for use in electronics are to be classified in this Chapter, provided that they are in forms unworked as drawn, or in the form of cylinders or rods. When cut in the form of discs, wafers or similar forms, they fall in heading 38.18.

**Subheading Note.**

1.- For the purposes of subheading 2852.10, the expression "chemically defined" means all organic or inorganic compounds of mercury meeting the requirements of paragraphs (a) to (e) of Note 1 to Chapter 28 or paragraphs (a) to (h) of Note 1 to Chapter 29.

## GENERAL

Unless the context otherwise requires, Chapter 28 is limited to separate chemical elements and separate chemically defined compounds.

A separate chemically defined compound is a substance which consists of one molecular species (e.g., covalent or ionic) whose composition is defined by a constant ratio of elements and can be represented by a definitive structural diagram. In a crystal lattice, the molecular species corresponds to the repeating unit cell.

The elements of a separate chemically defined compound combine in a specific characteristic proportion determined by the valency and the bonding requirements of the individual atoms. The proportion of each element is constant and specific to each compound and it is therefore said to be stoichiometric.

Small deviations in the stoichiometric ratios can occur because of gaps or insertions in the crystal lattice. These compounds are described as quasi-stoichiometric and are permitted as separate chemically defined compounds provided that the deviations have not been intentionally created.

### (A) **Chemically defined elements and compounds.**
(Note 1)

Separate chemical elements and separate chemically defined compounds containing **impurities**, or **dissolved in water**, remain classified in Chapter 28.

The term " impurities " applies exclusively to substances whose presence in the single chemical compound results solely and directly from the manufacturing process (including purification). The substances may result from any of the factors involved in the process and are principally the following :

(a) Unconverted starting materials.

(b) Impurities present in the starting materials.

(c) Reagents used in the manufacturing process (including purification).

(d) By-products.

It should be noted, however, that such substances are **not** in all cases regarded as "impurities" permitted under Note 1 (a). When such substances are deliberately left in the product with a view to rendering it particularly suitable for specific use rather than for general use, they are **not** regarded as permissible impurities.

Such elements and compounds are **excluded** from Chapter 28 when they are dissolved in **solvents other than water**, unless the solution constitutes a normal and necessary method of putting up these products adopted solely for reasons of safety or for transport (in which case the solvent must not render the product particularly suitable for some types of use rather than for general use).

Thus, carbon chloride oxides dissolved in benzene, alcoholic solutions of ammonia and colloidal solutions of aluminium hydroxide are **excluded** from this Chapter and fall to be classified in **heading 38.24**. Generally speaking, colloidal dispersions fall in **heading 38.24**, **unless** covered by a more specific heading.

Separate chemically defined elements and compounds as described above, put up with an added **stabiliser** necessary for their preservation or transport, remain classified in this Chapter. For example, hydrogen peroxide stabilised by addition of boric acid remains classified in heading 28.47; but sodium peroxide mixed with catalysts (for production of hydrogen peroxide) is **excluded** from Chapter 28 and is classified in **heading 38.24**.

Products added to certain chemicals to keep them in their original physical state are also to be regarded as stabilisers, **provided** that the quantity added in no case exceeds that necessary to achieve the desired result and that the addition does not alter the character of the basic product and render it particularly suitable for specific use rather than for general use. By application of these provisions **anti-caking agents** may be added to the products of this Chapter. Such products with added **water-repellents** are, on the other hand, **excluded** since such agents modify the original characteristics of the products.

**On the same condition** that the additions do not render them particularly suitable for specific use rather than for general use, the products of this Chapter may also contain :

(a) Added anti-dusting agents (e.g., mineral oil added to certain poisonous chemicals to prevent dusting during handling).

(b) Colouring substances added to facilitate identification or added for safety reasons to dangerous or poisonous chemicals (e.g., lead arsenate of heading 28.42) as a " marker " or warning to those handling the products. Products to which colouring substances have been added for other reasons (e.g., silica gel with cobalt salts added for use as a humidity indicator (**heading 38.24**)) are, however, **excluded**.

## (B) **Distinction between the compounds of Chapter 28 and those of Chapter 29.**
(Note 2)

The following is an exhaustive list of compounds containing carbon which are to be classified in Chapter 28, and of the headings in which they are to be classified :

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|---|---|
| Heading 28.11 - | Oxides of carbon.<br>Hydrogen cyanide, hydrogen hexacyanoferrate (II) and hydrogen hexacyano ferrate (III).<br>Isocyanic, fulminic, thiocyanic, cyanomolybdic and other simple or complex cyanogen acids. |
| Heading 28.12 - | Halide oxides of carbon. |
| Heading 28.13 - | Carbon disulphide. |
| Heading 28.31 - | Dithionites and sulphoxylates, stabilised with organic substances. |
| Heading 28.36 - | Carbonates and peroxocarbonates, of inorganic bases. |
| Heading 28.37 - | Cyanides, cyanide oxides and complex cyanides (hexacyanoferrates (II), hexacyanoferrates (III), nitrosylpentacyanoferrates (II), nitrosylpentacyano-ferrates (III), cyanomanganates, cyanocadmates, cyanochromates, cyano-cobaltates, cyanoniccolates, cyanocuprates, etc.), of inorganic bases. |
| Heading 28.42 - | Thiocarbonates, selenocarbonates, tellurocarbonates, selenocyanates, telluro-cyanates, tetrathiocyanatodiamminochromates (reineckates) and other double or complex cyanates, of inorganic bases. |
| Headings 28.43 - to 28.46 | Inorganic and organic compounds of :<br>(i) Precious metals.<br>(ii) Radioactive elements.<br>(iii) Isotopes.<br>(iv) Rare-earth metals, yttrium or scandium. |

Heading 28.47 - Hydrogen peroxide, solidified with urea, whether or not stabilised.
Heading 28.49 - Carbides (binary carbides, borocarbides, carbonitrides, etc.), **other than** hydrogen carbides (hydrocarbons).
Heading 28.52 - Inorganic and organic compounds of mercury, whether or not chemically defined, excluding amalgams
Heading 28.53 - Carbon oxysulphide.
Thiocarbonyl halides.
Cyanogen and halogen compounds of cyanogen.
Cyanamide and its metal derivatives (**other than** calcium cyanamide, whether or not pure - see Chapter 31).

**All other carbon compounds are excluded from Chapter 28.**

## (C) **Products which remain classified in Chapter 28, even when they are not separate chemical elements nor separate chemically defined compounds.**

There are certain exceptions to the rule that this Chapter is limited to separate chemical elements and separate chemically defined compounds. These exceptions include the following products :

Heading 28.02 - Colloidal sulphur.
Heading 28.03 - Carbon blacks.
Heading 28.07 - Oleum.
Heading 28.08 - Sulphonitric acids.
Heading 28.09 - Polyphosphoric acids.
Heading 28.13 - Phosphorus trisulphide.
Heading 28.18 - Artificial corundum.
Heading 28.21 - Earth colours containing 70 % or more by weight of combined iron evaluated as $Fe_2O_3$.
Heading 28.22 - Commercial cobalt oxides.
Heading 28.24 - Red lead and orange lead.
Heading 28.28 - Commercial calcium hypochlorite.
Heading 28.30 - Polysulphides.
Heading 28.31 - Dithionites and sulphoxylates, stabilised with organic substances.
Heading 28.35 - Polyphosphates.
Heading 28.36 - Commercial ammonium carbonate containing ammonium carbamate.
Heading 28.39 - Commercial alkali metal silicates.
Heading 28.42 - Aluminosilicates.
Heading 28.43 - Colloidal precious metals.
- Amalgams of precious metals.
- Inorganic or organic compounds of precious metals.

Heading 28.44 - Radioactive elements, radioactive isotopes, or compounds (inorganic or organic) and mixtures containing these substances.
Heading 28.45 - Other isotopes and their compounds (inorganic or organic).
Heading 28.46 - Compounds, inorganic or organic, of rare-earth metals, of yttrium or of scandium or of mixtures of these metals.
Heading 28.48 - Phosphides.
Heading 28.49 - Carbides.
Heading 28.50 - Hydrides, nitrides, azides, silicides and borides.
Heading 28.52 - Inorganic and organic compounds of mercury, excluding amalgams
Heading 28.53 - Liquid air and compressed air.
Amalgams **other than** amalgams of precious metals - see under heading 28.43 above.

## (D) **Exclusion from Chapter 28 of certain separate chemical elements and of certain separate chemically defined inorganic compounds.**
(Notes 3 and 8)

Certain separate chemical elements and certain separate chemically defined inorganic compounds are always excluded from Chapter 28, even when they are pure.

Examples are :

(1) Certain products of **Chapter 25** (i.e., sodium chloride and magnesium oxide).

(2) Certain inorganic salts of **Chapter 31** (viz : sodium nitrate, ammonium nitrate, double salts of ammonium sulphate and ammonium nitrate, ammonium sulphate, double salts of calcium nitrate and ammonium nitrate, double salts of calcium nitrate and magnesium nitrate, and ammonium dihydrogenorthophosphate and diammonium hydrogenorthophosphate (monoammonium or diammonium phosphates); also potassium chloride, though this may in certain cases fall in **heading 38.24** or **90.01**).

(3) Artificial graphite of **heading 38.01**.

(4) Precious or semi-precious stones (natural, synthetic or reconstructed), and dust or powder of such stones of **Chapter 71**.

(5) Precious metals and base metals, including alloys of such metals, of **Section XIV** or **XV**.

Certain other separate elements or separate chemically defined compounds, which would otherwise have been classified in Chapter 28, may be **excluded** when put up in certain forms, or if they have been subjected to certain treatments which leave their chemical composition unchanged (*).

Examples are :

(a) Products suitable for therapeutic or prophylactic uses, put up in measured doses or in forms or packings for retail sale (**heading 30.04**).

(b) Products of a kind used as luminophores (e.g., calcium tungstate) which have been treated to render them luminescent (**heading 32.06**).

(c) Perfumery, cosmetic or toilet preparations (e.g., alum), put up in packings of a kind sold by retail for such use (**headings 33.03** to **33.07**).

(d) Products suitable for use as glues or adhesives (e.g., sodium silicate dissolved in water), put up for retail sale as glues or adhesives in packages not exceeding a net weight of 1 kg (**heading 35.06**).

(e) Photographic products (e.g., sodium thiosulphate), put up in measured portions or put up for retail sale in a form ready for photographic use (**heading 37.07**).

(f) Insecticides, etc. (e.g., sodium tetraborate) put up as described in **heading 38.08**.

(g) Products (e.g., sulphuric acid) put up as charges for fire-extinguishers or put up in fire-extinguishing grenades (heading **38.13**).

(h) Chemical elements (for example, silicon and selenium) doped for use in electronics, in the form of discs, wafers or similar forms (**heading 38.18**).

(ij) Ink removers put up in packings for retail sale (**heading 38.24**).

(k) Halides of the alkali or of the alkaline-earth metals (e.g., lithium fluoride, calcium fluoride, potassium bromide, potassium bromoiodide, etc.), in the form of optical elements (**heading 90.01**) or of cultured crystals weighing not less than 2.5 g each (**heading 38.24**).

(*) These exclusions do not affect the products classifiable in headings 28.43 to 28.46 and 28.52 (see Notes 1 and 2 to Section VI).

## (E) **Products potentially classifiable in two or more headings of Chapter 28.**

Note 1 to Section VI deals with the problems of products potentially classifiable :

(a) In heading 28.44 or 28.45, and also in some other heading of Chapter 28.
(b) In heading 28.43, 28.46 or 28.52, and also in some other heading of Chapter 28 (other than heading 28.44 or 28.45).

Chemically defined complex acids consisting of a non-metal acid (of sub-Chapter II) and a metal acid (of sub-Chapter IV) are classified in heading 28.11 (see Note 4 to Chapter 28 and Explanatory Note to heading 28.11).

Except where the context otherwise requires, double or complex inorganic salts are to be classified in heading 28.42 (see Note 5 to Chapter 28 and Explanatory Note to heading 28.42).